

MACHINE-ASSISTED LANGUAGE TRANSLATION

John P. Grills

Introduction

Transitioning technology to address operational deficiencies as identified by Army commanders is a challenging task. In many instances, there is no clear path to follow. This article highlights an emerging case study in the subject area of assisted language translation, which is critical given the operational tempo (OPTEMPO) and breadth of our current missions. The example will focus on both technology and doctrinal issues involved with providing capability to our soldiers in the field.

Early Translation Efforts

The U.S. Army Materiel Command's Field Assistance in Science



FALCon

and Technology Activity (AMC-FAST) has been assisting field commanders by providing opportunities to demonstrate emerging technology in assisted language translation since the start of the program in 1985. Early efforts focused on the challenges of executing command and control in a U.S. Forces Korea–Republic of Korea (USFK-ROK) coalition environment, as well as assisting the military intelligence community with human intelligence (HUMINT) capabilities. The demonstrated systems concentrated principally on command center operations. Experience with early systems in this environment helped the research community focus on identifying where their efforts needed to be concentrated, but in reality, the early translation efforts fell short of the mark. This made it especially difficult to accomplish any cohesive doctrinal development.

As computing technology progressed, the capabilities of the software increased to some extent, but the problem seemed to flounder in the “too hard” category for many years, again closely related to the USFK-ROK interoperability context.

FALCon System Developed

Researchers at the Army Research Laboratory, working with the Defense Advanced Research Projects Agency (DARPA) under the direction of Dr. Melissa Holland,

used the information gleaned from interaction with the users to develop a useful capability by focusing on the area of document translation. This led to the AMC-FAST-sponsored development of the Forward Area Language Converter (FALCon) system in 1994 at 18th Airborne Corps.

FALCon allowed documents to be translated and key words to be searched to determine whether closer inspection by an experienced linguist was merited. This provided some useful capabilities to the HUMINT community and is a capability that has been expanded for use in 48 different languages. FALCon 4.0 was delivered to the Project Manager, Counter-intelligence/Human Intelligence (CI/HUMINT) Information Management System (PM, CHIMS) in July 2002 for inclusion into the CI/HUMINT Automated Tool Set (CHATS, v10) for developmental testing. Contingent on the results of testing, FALCon is expected to be implemented in 1,600 fielded CHATS units in FY03. CHATS is the first automated system introduced at a soldier level for tactical HUMINT teams, a milestone capability.

Establishing Requirements

Doctrinal development to allow incorporation of new technology for use in real-world missions is important to consider in concert with technical advances. Consensus in determining actual needs and trade-offs is often difficult to achieve. Thus it is important that technologists maintain continuous dialogue with the Army schoolhouses, in this case, the Intel Center at Fort Huachuca. Richard Herman, the AMC-FAST Science Advisor to U.S. Army Pacific (USARPAC) from 1999-2001 was instrumental in this regard, serving as the liaison between the technologists and the user community. Herman worked closely with LTC Kathy Debolt at the Intel Center at Fort Huachuca to establish an integrated concept team (ICT) to address the doctrinal development, and in turn build solid requirements into the

acquisition system. Prior to this effort, there were no official requirements for development of these capabilities. The culmination of the ICT effort has resulted in the Intel Center's development of the Sequoyah Foreign Language Translation System (S-FLTS) requirement documents, which are currently being staffed at Department of the Army G-8, Programs.

Spiral Development

OPTEMPO and technology usually continue to outpace doctrinal development, and new ideas continue to emerge—most notably in this context, the DARPA Information Technology Office Babylon Program and the development of the PHRASELATOR, or DARPA one-way hand-held translation assistant. (See <http://www.sarich.com/translator/> for complete system description.) Babylon was used as a technology feeder for the FY02 new start Language and Speech Exploitation Resources (LASER) Advanced Concept Technology Demonstration (ACTD).

LASER's objectives are broad:

- Reduce the foreign language barrier across the spectrum of transnational (civilian)/joint coalition (military) cooperation,
- Expedite access to foreign sources and accelerate processing,
- Integrate language translation into tactical and strategic warfare efforts and evidence gathering and processing, and
- Develop and sustain language skills.

LTC Debolt is the LASER Technical Manager at Fort Huachuca, and the U.S. Pacific Command is the Operational Manager. The current USARPAC Science Advisor Andrew Wood is coordinating all USARPAC activities in support of LASER. The PHRASELATOR device is one of the early products from this ACTD.



DARPA PHRASELATOR Spiral Development Devices

LTC James Bass, DARPA-Information Awareness Office Program Manager for Babylon, working closely with Dr. John Johnson, the V Corps Science Advisor, provided V Corps with some early prototype units for use in the FY02 Victory Strike exercises in Poland.

User acceptance is very positive, and this early use provides valuable ideas that are incorporated in an aggressive spiral development process by the DARPA prime contractor, Marine Acoustics Inc. Bass has been so successful with his program that the PHRASELATOR devices are in high demand. Per request of the Central Command, DARPA is providing direct support to Operation Enduring Freedom. Capability has been provided to 18th Corps and Special Operational Force units in the area of operations. Bass briefed the Babylon Program at the annual AMC-FAST Program Review in January 2002.

Conclusion

Because of the high demand across the Services, Bass requested that AMC-FAST act as the primary point of contact for the distribution and training of the PHRASELATOR prototypes for the Army. The AMC-FAST science advisors at the receiving commands are coordinating the distribution and data collection efforts in support of DARPA. This

quick response capability of AMC-FAST will be of great benefit to Babylon, the LASER ACTD, and the doctrinal development of this important capability. Putting equipment into the hands of a broad spectrum of users (HUMINT, military police, medical personnel, and humanitarian agencies) will, in effect, provide the type of critical data and feedback that is simply not obtainable in a traditional development environment. Language repositories at the Defense Language Institute will be the recipients of the data, and developers will gain a more complete understanding of the complex missions currently being executed by our soldiers across the globe ... a real win-win example of transitioning capability.

JOHN P. GRILLS is the Deputy Director of the U.S. Army Materiel Command's Field Assistance in Science and Technology Activity. He holds a B.S. in biomedical engineering from the Catholic University of America and is a Level III certified member of the Army Acquisition Corps. Grills' e-mail address is jgrills@nosc.mil.
